

CLAIMS

What is claimed is:

1. A method for plating CoNiFe comprising:
 - (a) providing a plating solution including hydroxymethyl-p-tolylsulfone, the plating solution being configured to provide a CoNiFe film having a high saturation magnetic flux density and having a composition of 50-70 weight percent of Fe and 3-8 weight percent of Ni; and
 - (b) plating the CoNiFe film on a substrate in the plating solution.
2. The method of claim 1 wherein the plating solution providing step (a) further includes the step of:
 - (a1) configuring the plating solution to provide the CoNiFe film having the high saturation magnetic flux density of greater than 2.2 Tesla and having a composition of 58-62 weight percent of Fe and 3.5-4 weight percent of Ni.
3. The method of claim 1 wherein the plating solution providing step (a) further includes:
 - (a1) configuring the plating solution to ensure that the CoNiFe film is a soft magnetic film.
4. The method of claim 3 wherein the CoNiFe film has a hard axis coercivity of less than or equal to two Oe and an easy axis coercivity of less than or equal to six Oe.

5. The method of claim 1 wherein the plating solution providing step (a) further includes:

(a1) configuring the plating solution to ensure that the CoNiFe film has a low perpendicular anisotropy field of less than thirty five Oe.

6. The method of claim 5 wherein the CoNiFe film has the low perpendicular anisotropy field of less than twenty Oe.

7. The method of claim 1 further comprising the steps of:

(c) adjusting the plating solution after step (b) to maintain the plating of the CoNiFe film having the composition and the saturation magnetic flux density; and

(d) plating a second CoNiFe film.

8. The method of claim 1 wherein the plating solution providing step (a) further includes:

(a1) including CoSO_4 , NiSO_4 , FeSO_4 , NH_4Cl , boric acid, Sodium lauryl sulfate, and saccharin in the plating solution.

9. The method of claim 1 wherein the plating solution providing step (a) further includes:

(a1) maintaining the plating solution at a pH of less than 3.

10. The method of claim 9 wherein the plating solution providing step (a1) further includes:

(a1i) maintaining the plating solution at the pH of substantially 2.8.

11. A magnetic recording head comprising:

a first pole;

a second pole;

a write coil residing between the first pole and the second pole;

a write gap residing between a portion of the first pole and a portion of the second pole;

wherein at least a portion of the first pole and/or the second pole are plated using a plating solution including hydroxymethyl-p-tolylsulfone (HPT), the plating solution being configured to such that the at least the portion includes a CoNiFe film having a high saturation magnetic flux density and having a composition of 50-70 weight percent of Fe and 3-8 weight percent of Ni.

12. The magnetic recording head of claim 11 wherein the CoNiFe film has the high saturation magnetic flux density of greater than 2.2 Tesla and a composition of 58-62 weight percent of Fe and 3.5-4 weight percent of Ni.

13. The magnetic recording head of claim 11 wherein the CoNiFe film is a soft magnetic film.

14. The magnetic recording head of claim 13 wherein the CoNiFe film has a hard axis coercivity of less than or equal to two Oe and an easy axis coercivity of less than or equal to six Oe.

15. The magnetic recording head of claim 11 wherein the CoNiFe film has a low perpendicular anisotropy field of less than thirty five Oe.

16. The magnetic recording head of claim 11 wherein the CoNiFe film has the low perpendicular anisotropy field of less than twenty Oe.